

Claims

1. Multi-layer film laminate comprising at least 4 layers (I) to (IV) arranged directly or indirectly in the following sequence:
5 layer (I) as one surface layer comprising at least one layer vapour-coated with aluminium or SiO_x or a metal oxide from the main groups 2 or 3, whereby the vapour-coated surface is adjacent to the following layer,
layer (II) as a gas barrier layer of resin,
10 layer (III) comprising at least one further layer vapour-coated with aluminium or SiO_x or a metal oxide from the main group 2 or 3 and
layer (IV) as a heat-sealable layer, which is the other surface layer of the
film laminate.

15 2. Multi-layer film laminate according to claim 1, characterised in that it is a resin film laminate.

20 3. Multi-layer film laminate according to claim 1 or 2, characterised in that the gas barrier layer (II) is a polyvinylalcohol layer.

25 4. Multi-layer film laminate according to one of the claims 1-3, characterised in that the vapour-coated layer (I) or (III), respectively, is based on a thermoplastical resin, particularly at least one polyester, at least one polyamide, at least one polyolefin or a copolymer thereof.

30 5. Multi-layer film laminate according to one of the claims 1-4, characterised in that the layer (I) and the layer (III) are based on identical or different resins, preferable on different resins.

6. Multi-layer film laminate according to one of the claims 1-5, characterised in that the layer (I) and/or the layer (III) exist at least two times and particularly the vapour-coated surfaces are adjacent to each other.

7. Multi-layer film laminate according to claim 6, characterised in that the layers (I) are based on different resins, particularly of polyamide and polyester or of polypropylene and polyester.

5 8. Multi-layer film laminate according to claim 6, characterised in that the layers (III) are based on identical resins, particularly polyester.

9. Multi-layer film laminate according to one of the claims 1-8, characterised in that the layer (I) and/or (III) are made of a coextrudate of at least two layers, particularly comprising a resin gas barrier layer, particularly an oxygen barrier layer.

10 10. Multi-layer film laminate according to claim 9, characterised in that the coextrudate consists of two polyamide layers (a) and a gas barrier layer (b), particularly of a hydrolysed ethylene vinyl acetate copolymer, which is sandwiched between the polyamide layers (a).

15 11. Multi-layer film laminate according to one or more of the claims 1-10, characterised in that the heat-sealable layer (IV) is based on a thermoplastic resin, particularly a homo- or copolyolefin, particularly LDPE, LLDPE, polypropylene, polybutylene, metallocenic polyethylene, HDPE, ethylene propylene copolymers, ethylene vinyl acetate copolymers or amorphous polyester, particularly an amorphous polyethylene terephthalate or an ionomer.

20 25 12. Multi-layer film laminate according to one or more of the claims 1-11, characterised in that the layer(s) (I) and/or the layer(s) (III), respectively, are vapour-coated with the same material.

30 13. Multi-layer film laminate according to claim 12, characterised in that the material is aluminium.

14. Multi-layer film laminate according to one of the claims 1-13, characterised in that the vapour-coated layer has a thickness of 30-80nm.

5 15. Vacuum insulation panels with a hermetically sealed wrapping comprising of a multi-layer film laminate according to one of the claims 1-14, whereby layer (I) is the outside surface layer of the wrapping.

10 16. Vacuum insulation panels according to claim 15 characterised in that they consist of an insulation material based on polyurethane foam or polystyrene foam each with open cells and/or a filler material based on silicium oxide.

15 17. Use of the multi-layer film laminate according to one or more of the claims 1-13 as gas impermeable wrapping of a vacuum insulation panel whereby layer (I) is the outside surface layer of the wrapping.